

AMENDMENTS IN REPLACEMENT FORM

IN THE CLAIMS:

Please amend claim 1 and add new claims 2 – 75 as provided below:

- 41
1. (once amended) An apparatus, comprising:
 - a) a line level selection unit that forms a primary traffic stream and a secondary traffic stream, said primary traffic stream comprising a plurality of signals that are received on one or more working or protection ingress lines, said secondary traffic stream comprising the path level protection signal for each of those of said signals within said primary traffic stream having path level protection; and
 - b) a path level selection unit that receives said primary traffic stream and said secondary traffic stream and forms an egress traffic stream by replacing, with its corresponding path level protection signal, any of those of said signals within said primary traffic stream having path level protection that have failed.

2. (new) The apparatus of claim 1 further comprising a framing and line interface unit that transmits said egress traffic stream onto one or more egress lines.

3. (new) The apparatus of claim 2 wherein said one or more egress lines further comprises a copper line.

4. (new) The apparatus of claim 2 wherein said one or more egress lines further comprises a fiber optic cable.

A2
cont

5. (new) The apparatus of claim 1 wherein said apparatus is a networking system that resides within a network.

6. (new) The apparatus of claim 1 wherein said primary traffic stream and said secondary stream are time division multiplexed streams.

7. (new) The apparatus of claim 1 wherein said line level selection unit can select said plurality of signals from a backplane in order to help form said primary traffic stream.

8. (new) The apparatus of claim 1 wherein each of said plurality of signals are a SONET signal.

9. (new) The apparatus of claim 8 wherein said SONET signal further comprises an STS-1 signal.

10. (new) The apparatus of claim 1 wherein each of said plurality of signals are a SDH signal.

11. (new) The apparatus of claim 10 wherein said SDH signal further comprises an STM-1 signal.

12. (new) The apparatus of claim 1 wherein said line level selection unit and path level selection unit are part of an egress channel that resides on a line card that can be plugged into a networking system.

13. (new) The egress channel of claim 12 wherein said line card further comprises an ingress channel.

A2
cont

14. (new) The apparatus of claim 12 wherein said line card is plugged into said networking system and said networking system is acting as a node within a network.

15. (new) An apparatus, comprising:

- 4A2
Cont
- a) a line level selection unit that forms a primary traffic stream and a secondary traffic stream, said primary traffic stream comprising a plurality of signals that are received on one or more working or protection ingress lines, said secondary traffic stream comprising the path level protection signal for each of those of said signals within said primary traffic stream having path level protection, said line level selection unit tailored to have a table that indicates where at least a portion of said plurality of signals can be found on a backplane so that said at least a portion of said plurality of signals can be selected from said backplane to help form said primary traffic stream; and
 - b) a path level selection unit that receives said primary traffic stream and said secondary traffic stream and forms an egress traffic stream by replacing, with its corresponding path level protection signal, any of those of said signals within said primary traffic stream having path level protection that have failed.

16. (new) The apparatus of claim 15 wherein said table can be configured to correlate each of said portion of signals within said primary traffic stream to the particular time slot within which it will be transported.

17. (new) The apparatus of claim 15 wherein said table can be configured to indicate where the working signal for each of said plurality of signals can be found on said backplane.

18. (new) The apparatus of claim 15 wherein said table can be configured to indicate where the protection signal for each of those of said plurality of signals

that are received on a first working ingress line can be found on said backplane, each said protection signal being received on a first protection ingress line.

19. (new) The apparatus of claim 18 wherein said first working ingress line and said first protection ingress line form a 1+1 protection group.

20. (new) The apparatus of claim 18 wherein said table can be configured to also indicate where the working signal for each of those of said plurality of signals that are received on a second working ingress line can be found on said backplane wherein said first working ingress line, said second working ingress line and said protection ingress line form at least part of a 1:n protection group.

21. (new) The apparatus of claim 15 wherein said line level selection unit can be tailored to have a plurality of cross connect tables that each indicate where at least a portion of said signals can be found on said backplane, wherein:

- A2
cont*
- 1) said table is one of said plurality of cross connect tables, said table a working cross connect table that indicates where the working signal for each of said plurality of signals can be found on said backplane; and
 - 2) an additional cross connect table is tailored for each of said one or more working ingress lines that is protected, each said additional cross connect table indicating where on said backplane the protection signal can be found for each of those of said plurality of signals that are received on a particular working ingress line of said one or more working ingress lines, wherein said particular working ingress line is protected.

22. (new) The apparatus of claim 21 wherein said line level selection unit can be tailored to have a protection group table that correlates each of said plurality of signals to the particular protection group to which each of said plurality of signals belongs.

23. (new) The apparatus of claim 22 wherein said line level selection unit, for each of said plurality of signals:

- 1) looks up, from said protection group table, the particular protection group to which a signal belongs; and
- 2) looks up a status value for the said particular protection group to which said signal belongs, said status value indicating which cross connect table of said plurality of cross connect tables are to be used for selecting said signal from said backplane.

24. (new) The apparatus of claim 15 wherein said line level selection unit is tailored to have a second table that indicates where those of said signals within said primary traffic stream having path level protection can be found on said backplane so that the path level protection signal for each of those of said signals within said primary traffic stream having path level protection can be selected from said backplane to help form said secondary traffic stream.

25. (new) The apparatus of claim 15 wherein said path level selection unit further comprises a multiplexer that receives said primary traffic stream at a first channel input and receives said secondary traffic stream at a second channel input, wherein said multiplexer has an output that provides said egress traffic stream, wherein said multiplexer has a channel select input that receives a value for each of said plurality of signals to indicate which of said inputs is to be enabled for that signal.

26. (new) A method, comprising:

- a) forming a primary traffic stream and a secondary traffic stream, said primary traffic stream comprising a plurality of signals that are received on one or more working or protection ingress lines, said secondary traffic stream comprising the path level protection signal for each of those of said signals within said primary traffic stream having path level protection; and

- b) forming an egress traffic stream by replacing, with its corresponding path level protection signal from said secondary traffic stream, any of those of said signals within said primary traffic stream having path level protection that have failed.

27. (new) The method of claim 26 further comprising framing said egress traffic stream into a SONET frame.

28. (new) The method of claim 27 wherein each of said signals is an STS-1 signal.

29. (new) The method of claim 26 further comprising framing said egress traffic stream into an SDH frame.

30. (new) The method of claim 29 wherein each of said signals is an STM-1 signal.

31. (new) The method of claim 26 wherein said primary traffic stream and said secondary traffic stream are time division multiplexed streams.

32. (new) The method of claim 26 wherein forming said primary traffic stream further comprises selecting said plurality of signals from a backplane.

33. (new) A method, comprising:

- a) forming a primary traffic stream and a secondary traffic stream, said primary traffic stream comprising a plurality of signals that are received on one or more working or protection ingress lines, said secondary traffic stream comprising the path level protection signal for each of those of said signals within said primary traffic stream having path level protection, wherein said forming said primary traffic stream further comprises:

A2
cont

- 1) looking up from a table an indication, for each of at least a portion of said plurality of signals, where each of said at least a portion of said plurality of signals can be found on a backplane; and
- 2) selecting from said backplane each of said at least a portion of said plurality of signals to help form said at least a portion of said primary traffic stream; and

b) forming an egress traffic stream by replacing, with its corresponding path level protection signal from said secondary traffic stream, any of those of said signals within said primary traffic stream having path level protection that have failed.

34. (new) The method of claim 33 wherein said table correlates each of said portion of said plurality of signals within said primary traffic stream to the particular time slot within which it will be transported.

35. (new) The method of claim 33 wherein said table indicates where the working signal for each of said plurality of signals can be found on said backplane.

36. (new) The method of claim 33 wherein said table indicates where the protection signal for each of those of said plurality of signals that are received on a first working ingress line can be found on said backplane, each said protection signal being received on a first protection ingress line.

37. (new) The method of claim 36 wherein said first working ingress line and said first protection ingress line form a 1+1 protection group.

38. (new) The method of claim 36 wherein said table also indicates where the working signal for each of those of said plurality of signals that are received on a second working ingress line can be found on said backplane wherein said

As
cont

first working ingress line, said second working ingress line and said protection ingress line form at least part of a 1:n protection group.

39. (new) The method of claim 33 further comprising configuring a plurality of cross connect tables that each indicate where at least a portion of said signals can be found on said backplane, wherein:

- 1) said table is one of said plurality of cross connect tables, said table a working cross connect table that indicates where the working signal for each of said plurality of signals can be found on said backplane; and
- 2) an additional cross connect table is configured for each of said one or more working ingress lines that is protected, each said additional cross connect table indicating where on said backplane the protection signal can be found for each of those of said plurality of signals that are received on a particular working ingress line of said one or more working ingress lines, wherein said particular working ingress line is protected.

A2
cont

40. (new) The method of claim 39 further comprising configuring a protection group table that correlates each of said plurality of signals to the particular protection group to which each of said plurality of signals belongs.

41. (new) The method of claim 40 further comprising, for each of said plurality of signals:

- 1) looking up, from said protection group table, the particular protection group to which a signal belongs; and
- 2) looking up a status value for the said particular protection group to which said signal belongs, said status value indicating which cross connect table of said plurality of cross connect tables are to be used for selecting said signal from said backplane.

42. (new) The method of claim 33 further comprising looking up indications from a second table where those of said signals within said primary traffic stream having path level protection can be found on said backplane.

43. (new) The method of claim 42 further comprising selecting those of said signals within said primary traffic stream having path level protection from said backplane with said indications so that said primary traffic stream having path level protection can be selected from said backplane to help form said secondary traffic stream.

44. (new) An apparatus, comprising:

a) a first egress channel, comprising:

- 1) a first line level selection unit that forms a first primary traffic stream and a first secondary traffic stream, said first primary traffic stream comprising a first plurality of signals that are received on one or more working or protection ingress lines, said first secondary traffic stream comprising the path level protection signal for each of those of said first signals within said first primary traffic stream having path level protection;
- 2) a first path level selection unit that receives said first primary traffic stream and said first secondary traffic stream and forms a first egress traffic stream by replacing, with its corresponding path level protection signal, any of those of said first signals within said first primary traffic stream having path level protection that have failed; and

b) a second egress channel, comprising:

- 1) a second line level selection unit that forms a second primary traffic stream and a second secondary traffic stream, said second primary traffic stream comprising a second plurality of signals that are received on one or more working or protection ingress lines, said second secondary traffic stream comprising

Ag
cont

the path level protection signal for each of those of said second signals within said second primary traffic stream having path level protection;

- 2) a second path level selection unit that receives said second primary traffic stream and said second secondary traffic stream and forms a second egress traffic stream by replacing, with its corresponding path level protection signal, any of those of said second signals within said second primary traffic stream having path level protection that have failed.

45. (new) The apparatus of claim 44 wherein said first egress channel further comprises a first framing and line interface unit that transmits said first egress traffic stream onto one or more egress lines.

46. (new) The apparatus of claim 45 wherein said one or more egress lines further comprises a copper line.

47. (new) The apparatus of claim 45 wherein said one or more egress lines further comprises a fiber optic cable.

48. (new) The apparatus of claim 44 wherein said apparatus is a networking system that resides within a network.

49. (new) The apparatus of claim 44 wherein said first primary traffic stream and said first secondary stream are time division multiplexed streams.

50. (new) The apparatus of claim 44 wherein said first line level selection unit can select said first plurality of signals from a backplane in order to help form said first primary traffic stream.

51. (new) The apparatus of claim 44 wherein each of said first and second plurality of signals is a SONET signal.

52. (new) The apparatus of claim 51 wherein said SONET signal further comprises an STS-1 signal.

53. (new) The apparatus of claim 44 wherein each of said first and second plurality of signals are a SDH signal.

54. (new) The apparatus of claim 53 wherein said SDH signal further comprises an STM-1 signal.

55. (new) The apparatus of claim 44 wherein said first egress channel resides on a first line card that can be plugged into a networking system and said second egress channel resides on a second line card that can be plugged into said networking system.

56. (new) The egress channel of claim 55 wherein said first line card further comprises a first ingress channel and said second line card further comprises a second ingress channel.

57. (new) The apparatus of claim 56 wherein each of said line cards are plugged into said networking system and said networking system is acting as a node within a network.

58. (new) The apparatus of claim 44 wherein said first and second egress streams form a 1+1 protection group.

59. (new) The apparatus of claim 58 wherein said first and second egress streams have the same signals.

60. (new) The apparatus of claim 42 further comprising:

a) a third egress channel, comprising:

- 1) a third line level selection unit that forms a third primary traffic stream and a third secondary traffic stream, said third primary traffic stream comprising a third plurality of signals that are received on one or more working or protection ingress lines, said third secondary traffic stream comprising the path level protection signal for each of those of said third signals within said third primary traffic stream having path level protection; and
- 2) a third path level selection unit that receives said third primary traffic stream and said third secondary traffic stream and forms a third egress traffic stream by replacing, with its corresponding path level protection signal, any of those of said third signals within said third primary traffic stream having path level protection that have failed.

Ag
cont

61. (new) The apparatus of claim 60 wherein said first, second and third egress streams form at least a portion of a 1:n protection group.

62. (new) The apparatus of claim 61 wherein said third egress channel feeds an egress line that acts as the protection line for said 1:n protection group, wherein said third line selection unit further comprises a first pair of tables for said first egress channel and a second pair of tables for said second egress channel, wherein:

- 1) said first pair of tables comprises:
 - a) a first table that indicates where the working signals of said first plurality of signals for said first primary traffic stream can be found on said backplane;
 - b) a second table that indicates where the path level protection signals for those of said first primary traffic stream signals

having path level protection can be found on said backplane;
and

2) said second pair of tables comprises:

- a) a first table that indicates where the working signals of said second plurality of signals for said second primary traffic stream can be found on said backplane;
- b) a second table that indicates where the path level protection signals for those of said second primary traffic stream signals having path level protection can be found on said backplane.

63. (new) A method, comprising:

- a) forming a first primary traffic stream and a first secondary traffic stream, said first primary traffic stream comprising a first plurality of signals that are received on one or more working or protection ingress lines, said first secondary traffic stream comprising the path level protection signal for each of those of said first signals within said first primary traffic stream having path level protection;
- b) forming a first egress traffic stream by replacing, with its corresponding path level protection signal from said first secondary traffic stream, any of those of said first signals within said first primary traffic stream having path level protection that have failed

while

- c) forming a second primary traffic stream and a second secondary traffic stream, said second primary traffic stream comprising a second plurality of signals that are received on one or more working or protection ingress lines, said second secondary traffic stream comprising the path level protection signal for each of those of said second signals within said second primary traffic stream having path level protection; and
- d) forming a second egress traffic stream by replacing, with its corresponding path level protection signal from said second secondary

traffic stream, any of those of said second signals within said second primary traffic stream having path level protection that have failed.

64. (new) The method of claim 63 further comprising framing said first egress traffic stream into a SONET frame.

65. (new) The method of claim 64 wherein each of said signals is an STS-1 signal.

66. (new) The method of claim 63 further comprising framing said first egress traffic stream into an SDH frame.

67. (new) The method of claim 66 wherein each of said signals is an STM-1 signal.

A2
Cont

68. (new) The method of claim 63 wherein said first and second primary traffic streams and said first and second secondary traffic streams are time division multiplexed streams.

69. (new) The method of claim 63 wherein forming said first and second primary traffic streams further comprises selecting said plurality of signals from a backplane.

70. (new) The method of claim 63 wherein said first and second egress streams form a 1+1 protection group.

71. (new) The method of claim 63 wherein said first and second egress streams have the same signals.

72. (new) The method of claim 63 further comprising:

- a) recognizing a failure or degradation of an egress networking line over which said first egress traffic stream is transmitted; and
- b) in response to said recognizing:
- 1) forming a third primary traffic stream and a third secondary traffic stream, said third primary traffic stream comprising a third plurality of signals that are received on one or more working or protection ingress lines, said third secondary traffic stream comprising the path level protection signal for each of those of said third signals within said third primary traffic stream having path level protection; and
 - 2) forming a third egress traffic stream by replacing, with its corresponding path level protection signal from said third secondary traffic stream, any of those of said third signals within said third primary traffic stream having path level protection that have failed.

Ag
cont

73. (new) The method of claim 72 wherein said first, second and third egress streams form at least a portion of a 1:n protection group.

74. (new) The method of claim 73 wherein said first plurality of signals is the same as said third plurality of signals.

75. (new) An egress channel, comprising:
a line level selection unit that selects signals from a backplane, said line level selection unit having a clock that times egress time slots associated with an egress network line coupled to said egress channel, said egress channel having primary protection group table that correlates said egress time slots to a protection group for each ingress signal used to fill said egress time slots, said protection group table having an output coupled to a channel select input of a first multiplexer, said first multiplexer having input values that reflect the status of each said protection group for each said ingress signal, said first multiplexer

AG
and

having an output coupled to a channel select input of a second multiplexer, said second multiplexer receiving a plurality of inputs from a plurality of tables that indicate where an ingress signal may be found on said backplane.
